

Notes on the *Erebia* of the French Massif Central

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Comparison with specimens from other areas:

The Alps. Ssp. *aetherius* from the Alps is generally much more poorly marked than specimens from the Auvergne none of which have the typical *aetherius* characteristic of the loss of the ocellus and the constriction of the orange band is S3 on the forewing upperside. Specimens from Aigoual are also distinct from *aetherius* as although *aetherius* often has a reduction in ocelli, it is not usually associated with the substantial reduction in marking found in Aigoual specimens. *F. nelamus* from high level in the Alps is, however, nearer to those from Aigoual than other forms.

British Isles. Again ssp. *mnemon* is distinctly different from Auvergne *epiphron*. Based on Cribb and Porter's analysis, Perthshire specimens are of comparable size, males 17.90 mm, females 18.10 mm. They are, however, more poorly marked. In the males four ocelli on the forewings occur in only 44% upperside and 10% underside. The orange markings of the best marked Perth specimens do not approach those of Auvergne specimens. Cumberland specimens are better marked, 68% having four ocelli on the upperside forewings although most only have two underside. They are, however, very much smaller, the males average only 15.93 mm and the females 16.50 mm. While *mnemon* is more poorly marked than Auvergne specimens, it is better marked than those from Aigoual. Even in the more poorly marked Perthshire specimens the substantial majority have three or four ocelli on the forewings upperside compared with two in specimens from Aigoual and three on the hindwings compared with none.

East Pyrenees. Specimens from the area round Pic Carlit, near Mont Louis, Pyrenees Orientales, do not appear referable to ssp. *fauveaui*. De Lesse's description of *fauveaui* from Canigou states that 30-40% of the males have a fifth ocellus on the forewings. This, however, occurs in none of my series from Carlit. These are similar in size to those from the Massif, the males average 18.25 mm and the females 18.59 mm. The markings are very like those in specimens from the Auvergne, although the ocelli are slightly stronger. In the males almost all have four ocelli on the forewings upper and underside. On the hindwings the number varies between two and four but most have three or four. Although individual specimens from Carlit and Mont Dore are identical, in the series as a whole the ocelli in the Pyrenean specimens are slightly larger. The females from Carlit are also very similar to those from the Massif.

Central Pyrenees. Ssp. *pyrenaica*, my series from Col du Tourmalet, Haute Pyrenees are not like ssp. *aetherius*. In all respects but one they are similar to those from Carlit. The

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orange markings on both wings upperside in the males are reduced, although the ocelli are still present and well developed. In size they are again comparable, the males average 18.43 mm and the females 18.50 mm. De Lesse linked his f. *cebennica* from Aigoual to ssp. *pyrenaica*, however, I can see no close resemblance between them. Despite the reduction in orange markings in *pyrenaica* they usually retain a full complement of ocelli in most specimens, four on the forewings and three on the hind.

The Vosges. I have examined the specimens from this area in the B.M. collection. While I have not measured these they appear of comparable size to those from the Massif, although those from Mont Dore may be slightly larger. They are well marked and in some respects appear better marked than Auvergne specimens, particularly on the upperside of the hindwings where the orange rings round the ocelli are larger. The ocelli on the underside of the forewings also appear slightly better developed. Generally, however, the differences are slight.

Conclusion. The substantial similarity between specimens from the Vosges, Auvergne and Eastern Pyrenees in my view confirm Warren's assessment that they are one subspecies. I have not found *epiphron* from other areas that appear directly comparable. Specimens from these three areas are sufficiently distinct from those both from the Alps and the United Kingdom to warrant separate subspecific status. The situation in the Pyrenees is less clear and is not really within the scope of this paper. I would, however, be surprised if four different subspecies from this area could be justified. I have not seen any Pyreneen specimens that I would consider to be ssp. *aetherius* and Warren tends to over stress the differences between ssp. *mackeri* and ssp. *pyrenaica*. My own tentative view is that perhaps only one subspecies occurs there and that this has developed different forms throughout its range, a particularly well marked form (*fauveaui*) at the eastern end of its range and a duller one in the west (*pyrenaica*). I am doubtful that *mackeri*, *fauveaui* and *pyrenaica* all merit separate subspecific status but feel that two are perhaps forms of the other. If this view should prove correct, *pyrenaica* as the earliest name would take priority and *mackeri* and *fauveaui* would become its progressively better marked forms. This would result in specimens from the Auvergne and Vosges becoming ssp. *pyrenaica* f. *mackeri*. This however is only speculation and requires more work in the Pyrenees to either prove or disprove it. At present, therefore, I think specimens from the Auvergne should continue to be considered as ssp. *mackeri*, originally described from the Vosges.

Epiphron from Mont Aigoual must be considered separately. It is clearly not *mackeri* and, while de Lesse described his *cebennica* as a form of *pyrenaica*, as already mentioned this would not be my view. It appears closest to ssp. *aetherius* f. *nelamus*. However, while *nelamus* is the high level form of *aetherius*, *cebennica* occurs at a much lower altitude.

In view of this, its isolated situation and its difference from other subspecies, I think it should be considered as a separate subspecies. It is interesting to note that but for an oversight nearly 200 years ago we would be faced with no problem regarding the status of these specimens as Mont Aigoual would be the type locality for this species. Specimens from this locality were described and illustrated as a new species by Ernst in Tome II of his *Papillons d'Europe* published in 1780, three years before Knoch's *Papilio epiphron* from the Hartz Mountains. Ernst, however, failed to use the Linnean system of nomenclature and called the species "Le Montagnard", appropriate but not scientific, and thus Knoch's later type locality from which the species now seems to be extinct takes precedence.

Figures 12 and 13 show a pair of *mackeri* from Montes Dore and figures 14 and 15 show a pair of *cebennica* from Mont Aigoual.

Erebia sudetica Stg.

This species was first described from Cantal by de Lesse in 1947 and named f. *lioranus*. In fact he described it as a form of *E. melampus* ssp. *tigranus* Frhst. Warren separated *sudetica* and *melampus* in 1949 and attached *lioranus* to *sudetica*. I have not visited the type locality of this subspecies, Le Lioran on the western side of the Plomb du Cantal, but it is common on the hills to the east of the Plomb. On 26th July, 1974 most specimens were worn at about 1,200 metres, but at higher levels, up to 1,400 metres, they were still fresh. The species was flying with *E. epiphron* but is sufficiently different both in size (smaller) and markings to make identification on the wing no problem. The species was again common in the same area in 1975, when I also found it on Puy Mary (12th August). It seems restricted to the higher Cantals as there are no records of it from elsewhere in the Massif that I am aware of.

Erebia aethiops Esp.

I have only encountered *aethiops* in one locality in the Massif, near Condat, Cantal. I found it quite by chance in 1974 when driving south from Mont Dore to Plomb du Cantal. On that occasion I saw just a single male (25th July). In 1975 I revisited this locality twice specifically to look for this species. On the first occasion, 22nd July, the males were fresh but I only found one female. I returned on 12th August and although dull and overcast, in a short break when the sun came out I found four females before it went in again.

While Warren (1936) had not seen *aethiops* from the Auvergne, he doubted if the type occurred there and suggested that ssp. *sapaudia* Frhst. might. Bretherton (1966) also stated that ssp. *sapaudia* possibly occurred in the Auvergne and the Cevennes. To date these doubts concerning the status of this species in the Massif appear not to have been resolved.

In an endeavour to clarify this point, I have examined my series of ten males and five females and compared them with specimens from other localities. The forewing measurements

of the males range between 22 mm and 24.5 mm and average 23.7 mm. The females range between 24 mm and 25 mm and average 24.3 mm. In the males the red band on the forewings is well developed, usually extending right across S1a and into S1b. On the hindwings the orange markings extend from S2 to S5. In addition to the ocelli in two, three and four about half a small one in S5. On the underside the bands are well defined and the post discal one is usually silvery and contains four small spots in most cases. The females which have wide bands on the forewings, are much more yellowish in colour than the males; three of the five have more than the normal three ocelli on the forewings and all but one has four ocelli on the hindwings upperside. The undersides are of both the silver (four) and gold (one) types.

Having examined the extensive series in the British Museum, I consider these specimens to be ssp. *sapaudia* and thus can confirm Warren's suggestion. Figures 5 and 6 show the male upper and underside and figures 8 and 9 show the female upper and underside.

Erebia ottomana H.-S.

This species was not known to occur west of Lake Garda until discovered on Mt. Mezenc, Haute Loire in 1941 and described by Praviel as ssp. *tardenota*. Other localities given by de Lesse (1947) were Gerbier de Jonc and Foret de Bauzon, Ardeche. These localities were also the only ones given by Bretherton (1966) and Higgins and Riley (1970). In fact the range of this species in the Massif is rather more extensive than this. It occurs further south in Ardeche and its range also extends westward. I found it common at Col de Meyrand, Ardeche between 25th and 29th July, 1972. To the west I encountered the odd specimen on the high ground above Les Salesses just north of Belvezet in Lozere on 26th July, 1972. The furthest west I have so far found it, however, is on the Plateau du Palais du Roi at the southern end of the Margeride on 11th August, 1975. Its range thus extends well into Lozere.

This species is not prone to much variation and no major aberrations appear to have been described. However, I took a remarkable one at Col de Meyrand on 25th July, 1972. The usual twin apical ocelli on the forewings are replaced by a single large completely round one with a single white centre spot. This occurs on both the upper and underside. The usual three small ocelli on the hindwings upperside are absent, although the orange markings are present. In other respects the specimen is normal although slightly smaller than average. The effect of the single large ocellus on the forewings is to substantially alter the appearance of the specimen as can be seen from figure 11.

Erebia oeme Hübn.

Warren (1936) lists the type species from Forez but although unaware of any records, suggested that ssp. *pacula* Frhst. might possibly occur in the Auvergne. De Lesse (1947), however, took the view that all specimens from the Massif were *pacula* not the type. He gave its localities as Forez, Montes

Dore, and Montes d'Aubrac. I found the species in the Valley de Chaudfour, Montes Dore on 23rd July, 1974 when it was almost over and I also found it common near Aubrac on 24th July, 1975. While I have not seen specimens from Forez, I would agree with de Lesse that those from Montes Dore and the Aubracs are ssp. *pacula*. They appear identical to specimens from the Jura, the type locality of this subspecies.

Ssp. *pacula* also occurs in the Pyrenees but the form from the area of Mont Louis, Pyrenees Orientales is better marked than those from the Massif and Jura. In most males from the Massif the upperside forewing markings are restricted to the two apical ocelli and the orange markings round them. In those from Mont Louis, however, the orange band is extended and a number of specimens have a third ocellus in S4. On the hindwing upperside most from the Massif have three small ocelli, while in those from the Pyrenees the ocelli are not only larger but often increased to four. All my Mont Louis specimens have five ocelli on the underside hindwings, the size of the ocelli in Massif Central specimens is smaller and the first and fifth are very small with one or other absent in a number of examples. The females from Mont Louis are also better marked both in size of ocelli and extent of orange markings than their counterparts from the Massif.

The range of this species in the Massif is odd. As it occurs in the Montes Dore and Montes d'Aubrac, I would have expected it to be found in the Cantals which lie between them, but I know of no records of it from this area.

Erebia meolans de Prun.

This species is very widespread in the Massif, although nowhere have I found it numerous except at Col de Meyrand. I have encountered it in the Valley du Chaudfour (Montes Dore), Condat (Cantal), Plomb du Cantal, Aubrac (Montes d'Aubrac), Plateau du Palais du Roi (Lozere), Col de Meyrand (Ardeche) and Mont Aigoual. De Lesse also refers to it from Forez.

A lot of confusion exists concerning the subspecific status of the species in the Massif. Warren gives ssp. *meolans* from the Auvergne. De Lesse reached no firm conclusion except that he did not think that the species in the Massif was exclusively *meolans* but also *stygne* Ochs. Bretherton (1966(2)) suggested that specimens from Montes Dore might be ssp. *posidonia* Frhst., while those from Aigoual might be f. *calaritas* Frhst.

Unfortunately I am not able to provide any definite clarification of this situation as with such a variable species it would be necessary to examine much longer series from the different localities than I possess. No noticeable differences in size appear to exist, specimens range from 19 to 22 mm but the average forewing measurement from all areas is approximately 21 mm. I have only one specimen from Montes Dore so I can not really comment on this. My males from Cantal and Aubrac show no constant differences, although those from Cantal are slightly more strongly marked. Specimens from Meyrand are

also similar but with the orange markings slightly less well developed. My three males from Plateau du Palais du Roi do not provide sufficient material for any firm view, but are interesting as their ocelli on the forewings upperside are all noticeably smaller than in those from elsewhere, although the orange markings are not. Specimens from Mont Aigoual are also distinct, all exhibit to a greater or lesser degree a substantial reduction in the orange markings upperside. The ocelli are also reduced with the exception of the apical ones.

Figure 3 shows a typical male from Aigoual, while figure 4 shows a typical one from Cantal.

As a somewhat tentative conclusion, it would appear that specimens from Cantal and probably Montes Dore and Aubrac are referable to ssp. *meolans*, while those from Aigoual are ssp. *stygne*. Those from Lozere and Ardeche would seem to be intermediates.

ACKNOWLEDGEMENTS

My thanks to Mr. P. W. Cribb and Dr. C. J. Luckens for their help with comparative material.

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